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ABSTRACT

A study described Pittsburgh's education and training system for producing skilled and semiskilled workers and sought to identify challenges that the system will face as the area's economy strives for increased vitality. The study addressed multiple education and training functions, including preparing youth for productive careers, supporting the development of work skills through employees' lifetimes, and helping displaced and disadvantaged people to develop skills and find meaningful jobs. Data were collected through interviews with leaders in the education and training field and with employers; analyzing employment and demographic trends that affect the demand for work-related skills; and development of a "map" that describes the work-related education and training system in the region. Among the results of the study are that: (1) the system was estimated to have spent $550 million of private and public funds in 1985; (2) employers were the largest source of training, followed by the public schools, proprietary schools, and the community colleges; (3) employment has shifted from manufacturing to services and more people are employed in small establishments; (4) the region has relatively fewer young people than the nation as a whole and faces continuing declines in working age population; (5) 80 percent of elementary and secondary students are in small districts outside the city of Pittsburgh, and the system in general is fragmented; and (6) the community must decide whether continued economic vitality requires a more coordinated education reform effort. (The document includes 15 charts and 13 references.) (CML)

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Education, Employment, and the Economy

An Examination of Work-Related Education in Greater Pittsburgh

Thomas K. Glennan, Jr.,
with Susan Bodilly, James Harvey,
David Menefee-Libey, Anthony Pascal

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Prepared for the
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THE RAND CORPORATION

Teachers College, Columbia University

PREFACE

In February 1988, The RAND Corporation initiated a study of education and training systems that produce skilled and semiskilled workers for Pittsburgh's changing economy. In its initial stage, the effort was intended to:

- Help Pittsburgh develop a comprehensive picture of its changing requirements for work-related education and training and the institutions currently involved in this enterprise, and
- Help local leaders improve the capacities and performance of the work-related education system.

Four major classes of activities were undertaken in the initial effort:

- Interviews with leaders of education, training, employment, and community institutions,
- Analyses of employment and demographic trends affecting the demands for work-related skills,
- Interviews with employers concerning hiring and training practices, and
- Development of a "map" describing the work-related education and training system in Pittsburgh.

The major questions driving this investigation were how work-related education and training function as a system in the Pittsburgh region and what challenges will that system face as the area's economy strives for increased vitality. The study addresses these education and training functions:

1. Preparing the region's youth for productive careers,
2. Supporting the development of work skills through the employee's lifetime, and
3. Helping the displaced and disadvantaged to develop skills and find meaningful jobs.

The results of this initial effort should support subsequent, community-based activities contributing to strategic planning and leadership development for education and training in the Pittsburgh region.

The research reported here was conducted by The RAND Corporation in association with the National Center on Education and Employment, Teachers College, Columbia University. Financial support was provided by the Office for Educational Research and Improvement of the Federal Department of Education and the Howard Heinz Endowment.

This Note is based on a briefing that has been presented to a variety of groups and individuals in Pittsburgh and elsewhere. It provides the leaders and citizens of Pittsburgh with some of the information they will need to determine whether their work-related education system is adequate to meet the challenges of the coming decade.

SUMMARY

This study describes the changing economy of the Pittsburgh region and the education and training system that serves the region's needs for skilled and semiskilled labor. The work-related education system, which develops entry level skills, provides continuing education and training, and serves displaced and disadvantaged workers, is estimated to have involved public and private expenditures of $550 million in 1985. Employers were the largest source of education and training followed by the public schools, proprietary schools, and the community colleges. Community-based organizations, apprenticeship programs, and four-year higher education institutions also played roles.

The Pittsburgh region's economy and demography have changed radically over the past several decades with resulting changes in the demands they place on the work-related education system. Employment has shifted from manufacturing to services; more people are employed in small work establishments; and the level of skills required for many jobs has increased. As in the rest of the country, there is every reason to believe that the technology and organization of the workplace will continue to change, requiring analogous changes in the education and training system.

While the region's level of employment decreased in the first half of the 1980s, it has recently started to increase. Most observers expect continued, if modest, growth. However, the prolonged decline in high paying manufacturing jobs coupled with the fairly stagnant economic conditions has led to continued migration out of the region. This migration, which has been significant for nearly three decades, means that the region has relatively fewer young people than the nation as a whole and faces a probability of continuing declines in working age population.

To sustain economic vitality in the face of these demographic changes requires the region to make more effective use of its human capital. Young people who are dropping out of school or emerging with inadequate skills must be provided with preparation necessary for a modern labor force. Those now in the labor force should be encouraged to upgrade their skills to keep up with changing workplace needs. Workers displaced from jobs by technological and competitive forces must be helped to obtain new skills and jobs. Youth and adults not in the labor force should be provided encouragement and competencies to enter and succeed in the workforce.

The education and training system available to meet these needs is diverse and relatively uncoordinated. Elementary and secondary education is provided by some 80 separate public school districts and an array of private schools. Eighty percent of the students are in small districts outside the city of Pittsburgh. Virtually all of these districts have experienced very significant enrollment drops resulting from declining birthrates and the out-migration of young families. Graduates of these programs can continue their education at community colleges and proprietary schools as well as a variety of four-year colleges. Most, however, initially enter the labor force or military service. Community-based organizations, community colleges, and proprietary schools provide modest levels of services and training to disadvantaged youth and adults. These services are declining as federal funding dwindles. The largest source of training, however, is employers themselves; we estimate that nearly half the region's expenditures for work-related education are made by employers.

With a few important exceptions, education and training has not been a major regional concern. The community has rallied behind the Pittsburgh city schools to address the many problems of urban education. Allegheny County and its community college have made special efforts to address the problems of workers displaced by the closing of the steel mills and related industries. But the availability of relatively skilled and disciplined displaced workers coupled with the sluggish overall economic growth meant that most employers have had little difficulty in finding the workers they need. The combination of hoped for economic growth and demography suggests that the situation is changing and that education and training must become a more important part of the region's agenda.

Making improvements in the region's work-related education and training system will be difficult. Little is systematically known about the performance of elements of the system. We found little consensus about needed educational improvements beyond a general concern that incoming workers lack motivation. Current mechanisms to coordinate improvements in education and training across fragmented elementary, secondary, and postsecondary systems are weak. In our view, the region is now at a point where it must decide whether its continued economic vitality requires a more coordinated education reform effort or whether the largely independent activities of numerous providers of education and training will adequately serve the region's needs.

ACKNOWLEDGMENTS

This study is the product of continued interactions with numerous people in Pittsburgh and Harrisburg, Pennsylvania. Businessmen, educators, community leaders, and scholars in Southwest Pennsylvania were generous with their time. We have relied heavily on written information to which they guided us. Staff in the State Departments of Education, Labor and Industry, and Commerce provided continued assistance and advice. Many of these same people provided helpful comments on the briefings on which this Note is based.

Many colleagues at RAND and the National Center on Education and Employment were patient critics and contributors. Susan McElroy and Amy Praskac provided able research assistance. Paul Hill and Sue Berryman commented on earlier drafts. Nancy Rizor scheduled many trips and prepared the manuscript.

Finally, we have been fortunate to have three very supportive project monitors. Nevzer Stacey and Nabeel Alsalam provided patient and able support on behalf of the Office of Educational Research and Improvement. Joe Dominic of the Howard Heinz Endowment not only provided thoughtful inputs throughout our work but helped to make contacts and arrange meetings that were crucial to the success of our efforts.

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I. INTRODUCTION

This study examines the changing needs for work-related education in the Pittsburgh metropolitan region, identifies the education and training activities that meet these needs, suggests strengths and weaknesses of the identified activities, and proposes several broad actions for the community to consider to improve the performance of its work-related education and training system.

This Note frames the issues for a substantial regional planning effort. It provides a broad picture of the regional labor market and work-related education system as an aid to identifying those components deserving more careful examination by the Pittsburgh community. However, it does not evaluate the performance of the education and training system. The criteria for such an evaluation must be established by the community and the evaluation itself would require activities beyond the scope of the current study.

First we briefly define the work-related education system. Then in Section II we discuss the changing nature of the Pittsburgh region's economy and demography. Section III then provides a broad description of the institutions and activities that currently provide education and training in the region and identifies important attributes of their performance. The final section states our conclusions and suggests a number of actions that local leaders may want to take.

For the purposes of this study, we define the work-related education system as the institutions and activities that perform three major functions:

1. Provide the skills necessary for an individual entering the labor market,
2. Improve the knowledge and skills needed for current and future jobs, and
3. Assist disadvantaged individuals and displaced workers to develop skills and find work.

For the most part our perspective was that of a region seeking an adequate supply of well trained labor for skilled and semiskilled jobs. For these types of jobs, employers prefer to rely on people educated in local institutions and programs. Our emphasis was on sub-baccalaureate education and training provided by secondary schools, community colleges, trade schools, and selected programs at four-year institutions, as well as by employer-based training, apprenticeships, and community-based organizations. As shown in Table 1,

Table 1

FUNCTIONS EMPHASIZED BY INSTITUTIONS

Provider/Function	Job Entry	Continuing Education	Training for Those with Special Needs
Secondary schools	**	*	
Community colleges	**	**	*
Trade schools	**	**	*
Four-year colleges and universities	*	*	
Employer-based training		**	
Apprenticeships	**		
Community-based organizations			**

NOTE: * = secondary mission; ** = primary mission.

each class of institution emphasizes different functions, although the community colleges and trade schools are involved with all three.

Because we focus on the needs of employers, we have taken the regional labor market as the unit for our analysis. Specifically, our study covered the four counties that constitute the Pittsburgh Primary Metropolitan Statistical Area (PMSA) (see Fig. 1). This choice reflects the fact that employers typically hire workers from many communities within a metropolitan area. Potential new employers tend to assess the suitability of a region on the basis of the regional labor market.

Although the regional focus is normal for economic analyses, it is far less common for educational analyses, which have traditionally focused on a school system or a school. Looking at the educational resources that serve education and training needs in a region permits us to examine the roles and missions of elements of the system and the linkages among them. However, such a unit of analysis poses the difficulty, central to the conclusions of our study, that any reforms and improvements identified must be implemented by many quite distinctive educational authorities.

Although our emphasis is on regional needs, it is important to keep in mind that the needs of local employers should clearly not be the first priority of the public elementary and secondary school system or many of the other education and training institutions. Their first obligation is to provide each of their students with the knowledge and skills necessary to lead productive lives, whether or not they choose to stay in the region.

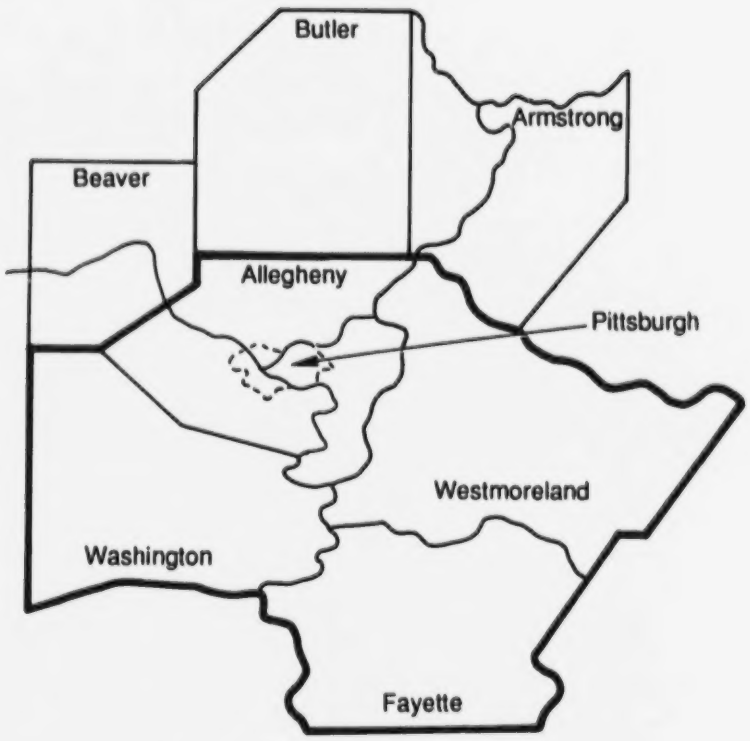


Fig. 1—Region covered by the study

II. THE NEED FOR WORK-RELATED EDUCATION

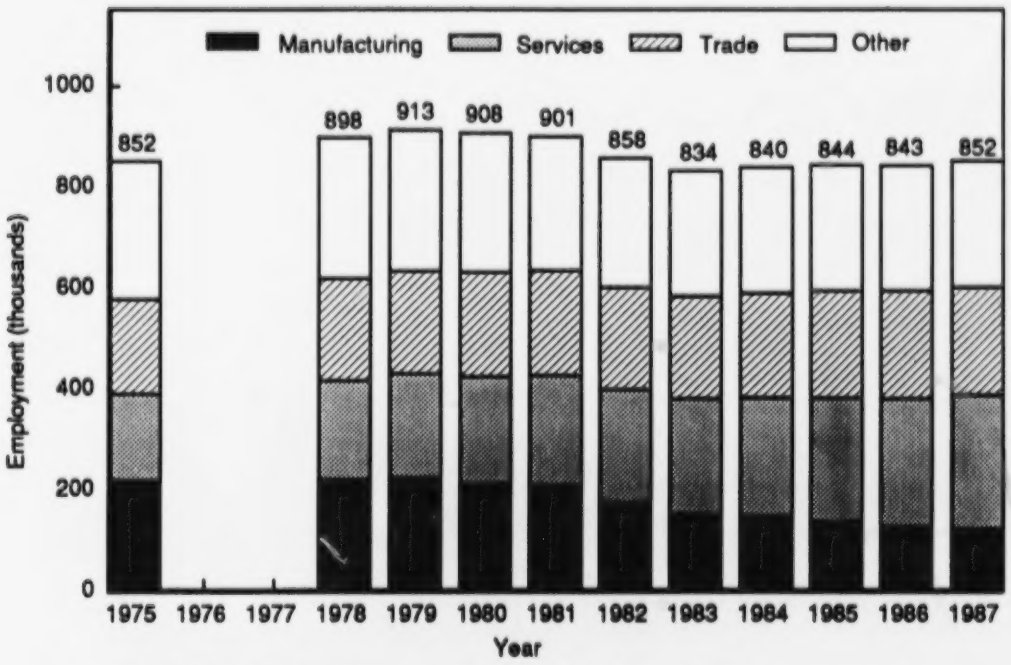
The evolving labor market and demography shape the demand for work-related skills in the Pittsburgh metropolitan area. A brief statistical portrait shows that the Pittsburgh region is experiencing most of the problems that have prominence nationally, but to a greater degree. During the past several decades it has experienced a significant restructuring of its economy, an absolute decline in population, and a large increase in the number of older citizens. This section broadly describes these changes and suggests their implications for education and training.

THE SHIFT FROM MANUFACTURING TO SERVICES IN THE REGIONAL ECONOMY

The economy of the Pittsburgh region has experienced an extraordinary level of restructuring (Fig. 2). In the 1960s, more than a third of the labor force was employed in manufacturing. By 1987, only 14.5 percent worked in this sector though the decline appeared to have halted. (For the nation as a whole, 27 percent of the labor force was employed in manufacturing in 1965; by 1987 the proportion had fallen to 21 percent.) The decline in manufacturing employment was gradual until the early 1980s when the recession precipitated the closing of many plants and manufacturing employment plummeted by nearly 40 percent.

The decline of manufacturing employment was accompanied by a steady increase of employment in service industries and, to a lesser extent, in wholesale and retail trade. Some of this increase was associated with individuals such as accountants leaving jobs with manufacturing establishments and joining firms in the service industries where they continued in the same occupation. But for many, the loss of manufacturing jobs meant unemployment or lower-paying jobs in new occupations.

The growth of employment in the service industries has not been sufficient to offset the loss of manufacturing jobs. Total employment in the region is down over the past decade, dropping by about 6 percent since 1979. It has just barely begun to move back upward.



SOURCE: Pennsylvania Department of Labor and Industry, Total Civilian Labor Force, Unemployment and Employment by Residence, Annual Averages 1978 to 1987 Pittsburgh PMSA, March 30, 1988, mimeo.

NOTE: "Other" category includes construction; finance; insurance and real estate; government; and transportation.

Fig. 2—Employment by industry

PROSPECTS FOR THE FUTURE

Most of the business people and community leaders whom we talked with expect Pittsburgh to experience modest growth in employment in the coming decade. One community leader referred to the current growth as "fragile," subject to truncation if the national economy turns sharply down. No one expects a major resurgence in manufacturing but many hope that the high-technology sector will show modest growth to complement the expected continuation in the growth of services.

To provide a more quantitative scenario for the future, we worked with Frank Giarratani at University Center for Social and Urban Research (UCSUR) at the University of Pittsburgh. Using an economic model relating the growth of the various segments of the regional economy to the projected growth of the national economy, we estimated the level

and composition of economic activity for the years 1995 and 2000 under two sets of assumptions. A "continuity" scenario assumes that Pittsburgh's economy evolves in a manner that continues the structural trends established in the 1970s and 1980s. In this scenario, total employment grows about 8 percent between 1986 and 1995 (compared with 12 percent for the nation as a whole). The decline in manufacturing employment of the early 1980s levels off and the service industries continue to grow.

In a second scenario, we arbitrarily assumed that manufacturing industries within the region staged a mild comeback. This led to a slight reversal in the decline of manufacturing employment and stimulated a substantially greater increase in service employment. Employment in this scenario increased 16 percent between 1986 and 1995.

The model producing these projections is based on historical and projected imports and exports of the region's products and services to national and international markets coupled with regionally generated demands for goods and services. It cannot take account of the distinctive and less quantifiable features of the region that may affect its future development. In interviews, a number of such features were mentioned. The airport expansion, relatively low housing costs, markets for services to the aging population, and spinoffs from the region's two major universities were suggested as sources of development potential. Projected shortages of entrants into the labor force, a deteriorated physical infrastructure, lack of major regional manufacturing industries serving as customers for small manufacturers, and a labor management climate perceived to be adversarial were cited as barriers to economic expansion.

We probed for whether human resources and the education and training systems were seen as assets in economic development. Employers we talked with, particularly those having experience in other regions, saw the current labor force as disciplined and qualified. However, many observers mentioned that new entrants to the labor force seemed to lack motivation and that a shortage of these new entrants was developing.[1] In general, the region's education and training programs for skilled or semiskilled occupations were not cited as assets or liabilities to economic development. Employers, developers, and even some of the educators to whom we spoke felt that the education and training system for skilled and semiskilled workers played a small role in attracting new employers to the area.[2]

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[1]Lack of motivation is not unique to the Pittsburgh region. See Commission on Workforce Quality and Labor Management Efficiency, *Investing in People: A Strategy to Address America's Workforce Crisis*, U.S. Department of Labor, Washington, D.C., 1989, pp. 8-9.

[2]The quality of other aspects of the region's education system are seen as important. Good elementary and secondary education systems are a factor in attracting professionals

In sum, there is a general expectation that Pittsburgh's economy will grow modestly in the coming decade while retaining its "postindustrial" character. There are some nagging concerns that such growth may not be sustained. The skills of the labor force are not currently seen as major determinants of the path of future development.

REQUIRED SKILLS OF THE FUTURE WORKFORCE

Projections of employment trends by industrial sector provide limited insight into future demands for education and training. To make accurate assessments, forecasts of job openings in various occupations are needed. Such forecasts are normally based on national estimates of distributions of occupations in a given industry coupled with estimates of likely changes in the size of the industry in the region. The forecasted increase or decrease in total jobs by occupation is combined with information on expected rates of separation from jobs (also by occupation) to obtain an estimate of total job openings.

The model used to project future employment in the Pittsburgh region estimates the level of employment by occupation. These projections, when combined with estimates of the retirements and deaths of people in the occupations, provide rough estimates of future

Table 2

OCCUPATIONS WITH THE GREATEST EXPANSION AND DECLINE IN THE PITTSBURGH PMSA UNDER CONTINUITY SCENARIO, 1986-1995

Expanding Occupations	Declining Occupations
Clerical except secretaries	Operatives
Food service workers	Construction technicians
Cleaning workers	Craftspeople
Health assistants	Private household workers
Personal service (barbers, etc.)	Real estate agents
Secretaries	Machinists
Nurses, therapists	Laborers (excl. construction)
Restaurant managers	Religious workers
Health technologists	

NOTE: Estimates of numbers of job openings by Anthony Pascal, based on REMI projections.

and managers to the region. The research universities are also an important draw for many employers.

occupational activities. Table 2 lists occupations expecting the greatest increases and declines in numbers of job openings under the continuity scenario.

As would be expected from the gross sector growth patterns, the occupations with large numbers of new openings are those common to service industries. The levels of skills required for the new jobs are not entirely obvious from the list—although food service and cleaning workers are not likely to be highly skilled. However, other studies conducted at the National Center on Education and Employment and elsewhere strongly suggest that the required skill levels in the economy as a whole are increasing. The proportion of the labor force in occupations requiring some postsecondary education is expected to increase and, in many occupations, the skills required are also likely to increase. Most frequently cited are the capacity to acquire new skills, identify and solve unexpected problems, interact with customers, suppliers, and fellow workers, and assume greater responsibility for structuring one's work. The need for these skills is associated with the greater pace and scope of change in the workplace required by relentless technological change (particularly the use of computers) and more pervasive competition.[3]

There are two important implications of these changed skill requirements for the work-related education system. First, the formal education system must impart those "generic" skills that enable its graduates to adapt to regularly changing conditions and to continually acquire new job-specific skills. This suggests that simply providing job-specific skills, without imparting the more general skills, shortchanges its students.

Second, given the rapid changes in industrial structure, the data underlying forecasts of occupations are suspect. For many industries, the occupational structures of firms making up an industry have been changing rapidly over the past decade. Projections based on old occupational structures may be misleading. They may provide a general picture of broad occupational growth and decline but are no substitute for close and continuing contact with local employers in projecting needs for and content of education and training programs.

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[3]See Thomas Bailey, *Changes in the Nature and Structure of Work: Implications for Employer-Sponsored Training*, the Institute on Education and the Economy, Teachers College, Columbia University, New York, February 1989; and Thierry J. Noyelle, *Beyond Industrial Dualism, Market and Job Segmentation in the New Economy*, Westview Press, Boulder, Colorado, 1987.

IMPLICATIONS OF CHANGES IN WORKPLACE SIZE FOR EDUCATION AND TRAINING

Much of the work-related training in the region is provided by employers. There is evidence from national studies that the level and character of their investment in training is related to an employer's size. Direct investments in training, either at work or elsewhere, tend to be lower for small firms than large ones.[4] Moreover, most of the training obtained by workers at small firms is provided outside the workplace.

The size of establishments has been decreasing in the course of the industrial restructuring resulting from technological change and the pressures of interregional and international competition. This is particularly apparent in the Pittsburgh area. Figure 3 displays data on changes in the size and number of work establishments in industries that traditionally have had large establishments. The data are for Allegheny County only.

In over half the industries shown, the number of work establishments increased between 1974 and 1984, in many cases by 50 percent or more. On the other hand, in almost all cases, the average number of employees in an establishment has decreased by 25 to 50 percent. For all industries in the county, the number of establishments has increased by 20 percent whereas the average size of an establishment has decreased by 13 percent.

These trends coupled with the national findings concerning the impact of establishment size on training have potentially important implications for the Pittsburgh region. The decline in firm size may mean that regional investments in training are decreasing at a time when other trends are requiring higher levels of work skills. It may also mean that a higher proportion of the postsecondary training is being provided by formal training and education institutions or by vendors providing specialized training at work sites than has traditionally been the case. As a result, individuals may have to bear greater responsibility for obtaining and financing continuing education and training to upgrade their skills. These possible changes reinforce the importance of maintaining close links between employers and the formal education system and may suggest a need for expanded outreach by formal education institutions to individuals needing to acquire new skills.

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[4]Sheldon Haber, Joseph Cordes, and James Birch, *Employment and Training Opportunities by Employers in Small and Large Firms*, Washington, D.C., June 1988, mimeo., Table 6. This is a study prepared for the U.S. Small Business Administration.

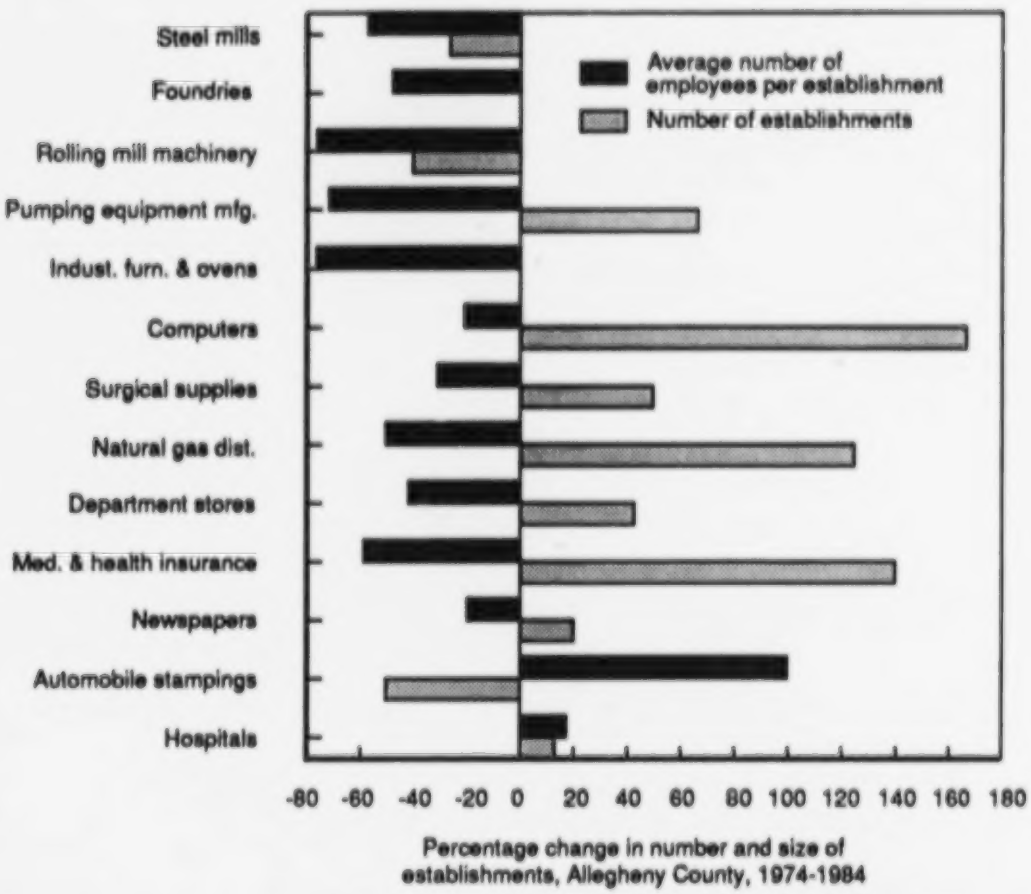

Steel mills
Foundries
Rolling mill machinery
Pumping equipment mfg.
Indust. furn. & ovens
Computers
Surgical supplies
Natural gas dist.
Department stores
Med. & health insurance
Newspapers
Automobile stampings
Hospitals
Average number of employees per establishment
Number of establishments
-80 -60 -40 -20 0 20 40 60 80 100 120 140 160 180
Percentage change in number and size of establishments, Allegheny County, 1974-1984
NOTE: For industries with median employment greater than 500 in 1974. Calculations by Anthony Pascal, from the County Business Pattern Database, prepared by the Bureau of Labor Statistics, U.S. Department of Labor.

Fig. 3—Change in size and number of work establishments

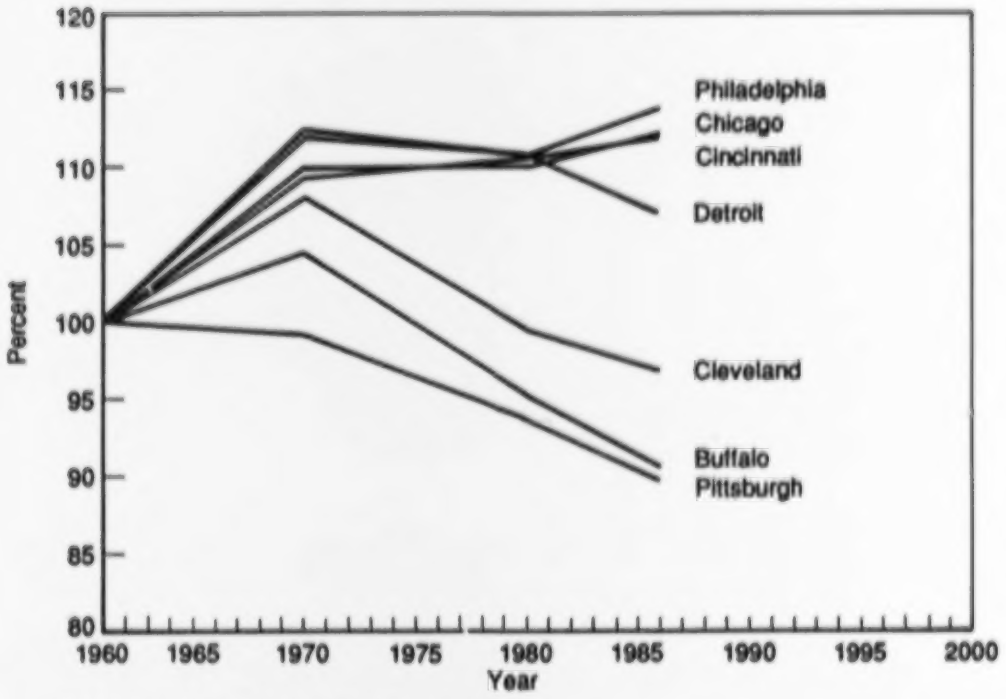
THE DECLINE IN THE REGION'S POPULATION

The economic changes just described have depressed the region's population growth. Though it has now been joined by several others, the Pittsburgh metropolitan area was the first in the nation to actually lose population. It has lost about 10 percent of its population in the last 25 years. Figure 4 shows that the Pittsburgh region has lost a greater proportion of its population than metropolitan areas such as Philadelphia and Cincinnati, in part because its employment base was less diversified than that of those cities. (Note that none of these cities kept up with the population growth of the United States as a whole, which grew about 35 percent over this time period.)

The loss of population is certainly directly related to the decline in the number of attractive jobs in the region. Individuals and families have left to pursue opportunities in areas experiencing growth in employment and relatively few have migrated to Pittsburgh because of the lack of employment opportunities.

CHARACTER OF MIGRATION FROM THE PITTSBURGH AREA

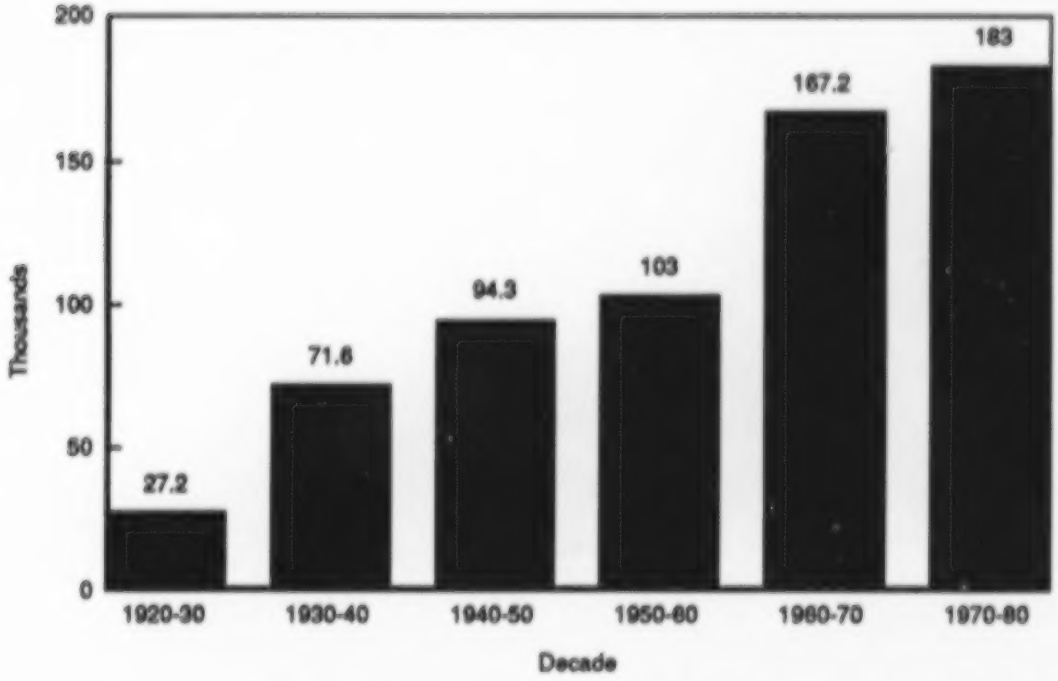
Migration from the Pittsburgh region is not a new phenomenon. There has been net out-migration from the region since at least 1920 although the region did not lose population in absolute numbers until after 1960.[5] Figure 5 indicates that net out-migration reached a



SOURCE: City and metro area data book.

Fig. 4—Changes in the population of nearby metropolitan areas

[5]Net migration is computed by taking the population at the beginning of a time period, adding the births and subtracting deaths during the time period, and subtracting the



SOURCE: Table 6, Giarratani and Houston, Economic Change in the Pittsburgh Region.

Fig. 5—Net out-migration from Pittsburgh metropolitan area

level of 183,000 people during the decade of the 1970s, a level equal to about 8 percent of the region's population in 1980. During this decade, the region lost population at a higher rate than all but three of the nation's 275 metropolitan areas. (Cleveland, Utica, and Buffalo lost population at a greater rate.) Although the numbers are high, the historic pattern of net out-migration is typical of the older U.S. cities that have regularly been the source of much of the population growth of the South and Southwest.

Figure 6 shows the age distribution in the net out-migration from Allegheny County for 1980 through 1985. It indicates that the level of out-migration has remained high and that much of the loss is concentrated among people between the ages of 15 and 34. This age group is important for two reasons. Its members are the major source of the entry-level and trainable labor force. It is also the age group that bears most of the children.

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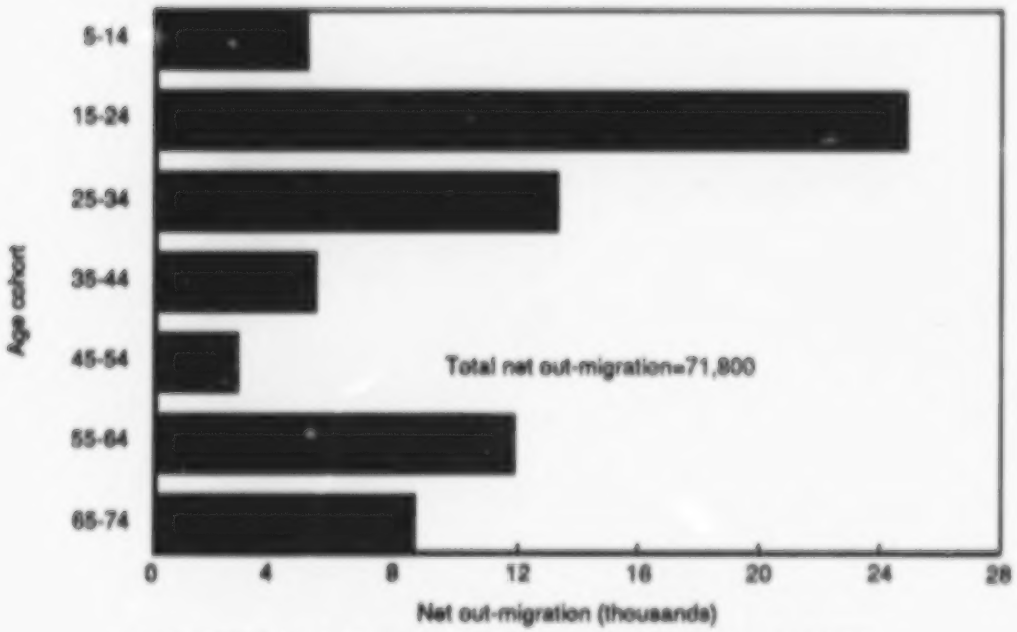
total from the population at the end of the time period. If the number is negative, more people left the area than entered or were born there over the time period.

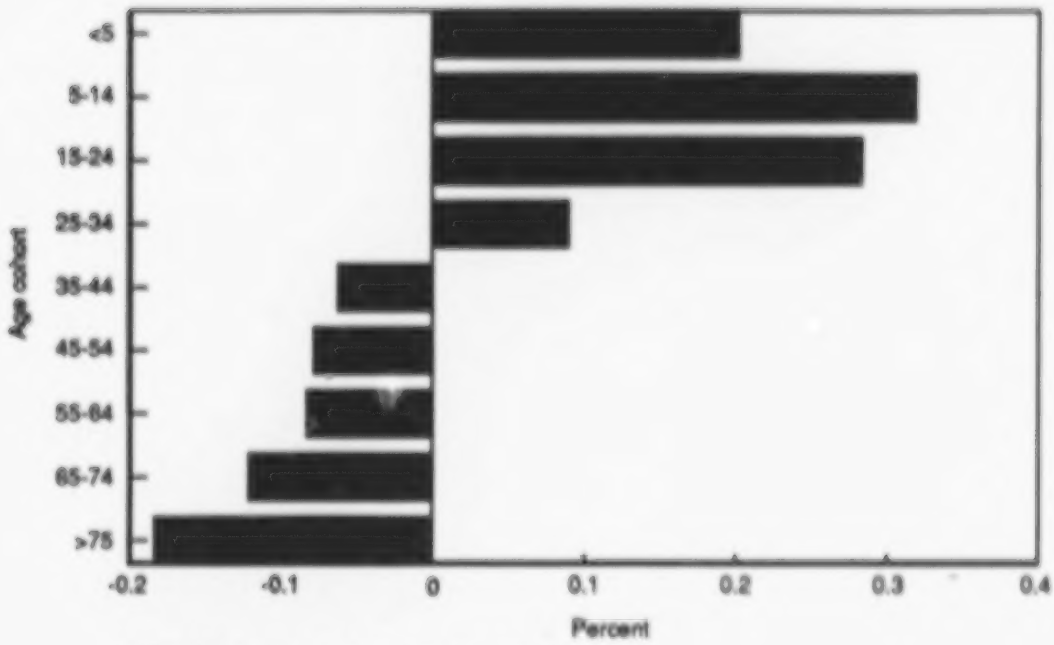


SOURCE: Table 1-10, Bangs and Singh, State of the Region, April 1988, University Center for Social and Urban Research, University of Pittsburgh, Pennsylvania.

Fig. 6—Age distribution of net out-migration

AGE DISTRIBUTION OF THE METROPOLITAN AREA POPULATION

Pittsburgh possesses a significantly smaller proportion of young people and a larger proportion of older people than the nation as a whole. This is graphically illustrated in Fig. 7, which shows the consequences of the combination of population losses among the younger age groups and the decline in birth rates. The figure compares the age distribution of the Pittsburgh metropolitan area's population with that of the nation in 1984. For example, it indicates that the Pittsburgh region has 22 percent fewer children under five years of age than it would have if the region's age distribution were the same as the nation as a whole.



SOURCE: County and city data book, 1988.

Fig. 7—Difference between distribution of populations of Pittsburgh and the nation as a whole

The low proportion of youth has important implications for education and training. It is widely noted that the nation faces a significant decline in the numbers of young people entering the labor force.[6] Figure 7 suggests that Pittsburgh's situation is likely to be even more extreme in this regard. The region will have to restructure its workforce to use fewer young, entry-level workers or attract more nontraditional entrants. Both alternatives can be expected to put additional demands on the education and training system. Also, the figures suggest that many of the region's school districts can expect continued decline in enrollments.

[6]William B. Johnson and Arnold E. Packer, *Work Force 2000*, the Hudson Institute, Indianapolis, Indiana, 1987, Chapter 3.

Pittsburgh's high proportion of older citizens has several consequences. They are an important source of demand for goods and services and have no doubt helped fuel Pittsburgh's transition to a service-oriented economy. At the same time, older populations generally are less anxious to support schools than are younger populations. This poses a continuing challenge to the community's leaders as they seek to assure a first-class educational system—a challenge which has so far been met by the Pittsburgh city schools.

By making several assumptions, it is possible to provide a picture of the Pittsburgh metropolitan area's population in the mid 1990s. We start with the population age 5 through 55 in 1984; these people (minus the few who die) will be 15 to 65 in 1994. From this number, we subtract the net number of people in each age group who would be lost to out-migration if the rates of out-migration for the region as a whole were *one-half* the rates experienced by Allegheny County between 1980 and 1985.[7] Thus we assume that out-migration will continue but at a reduced rate because of the economic growth of the region.

The results of this crude calculation are shown in Fig. 8 where we compare the distribution of population in 1984 and 1994. The total population between the ages of 15 and 65 falls by about 5 percent. There are significant declines in the 15 to 35 year old age groups, and increases in the number of people between 35 and 55.

These figures are worrisome on several grounds. The decline in numbers of young workers should lead to increased wage rates for entry-level and low-skilled jobs. In many communities, such increases would lead to increased in-migration. However, studies of migration patterns indicate that they are influenced by both labor market conditions and information flowing from friends and relatives already in the destination city. Pittsburgh has had no substantial in-migration since the turn of the century, and it will likely take some time for strong migration paths to be established. Moreover, although the decline in number of young workers is extreme in Pittsburgh, other communities are also experiencing decline, so that wage rates for these age groups will rise generally across the nation. Significant increases in wage differentials could be needed to attract migrants to Pittsburgh. A relative increase in the region's wages compared with other areas would lessen its attractiveness to new or expanding firms.

Another likely change in Pittsburgh's labor force is not clearly shown in Fig. 8. Our interviews suggest that, with the exception of industries such as fast food that employ low-skilled workers, employers have not had much difficulty attracting a high-quality workforce

[7]This assumption is quite arbitrary and the data in Fig. 8 should be viewed as illustrative only.

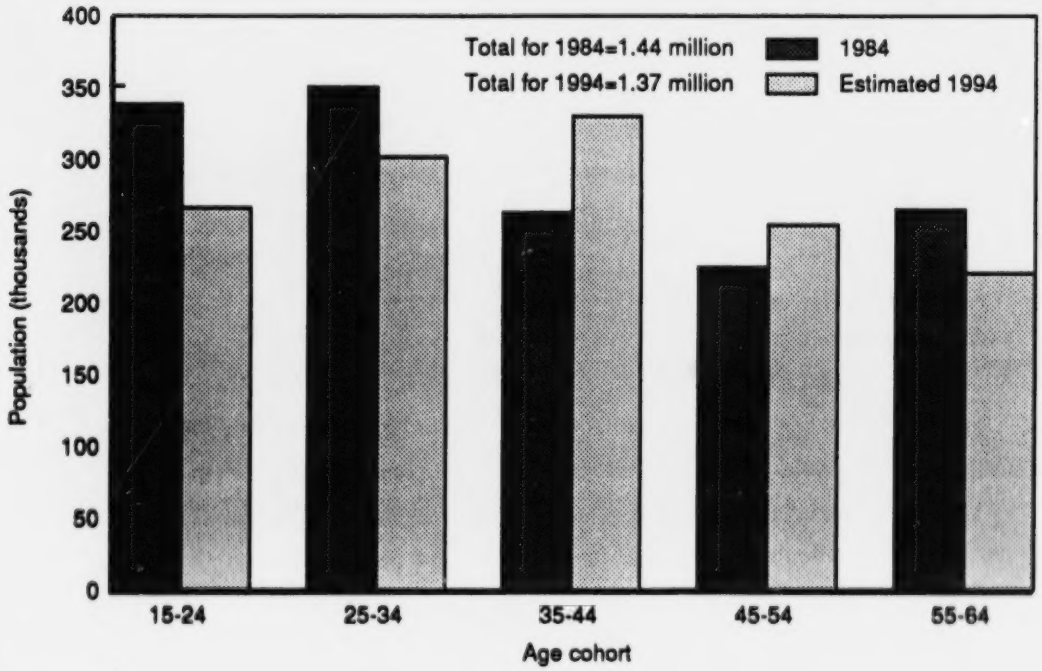


Fig. 8—Age distribution of Pittsburgh populations in 1984 and 1994 (Assumes regional out-migration rate is half the Allegheny County out-migration rate between 1980-1985)

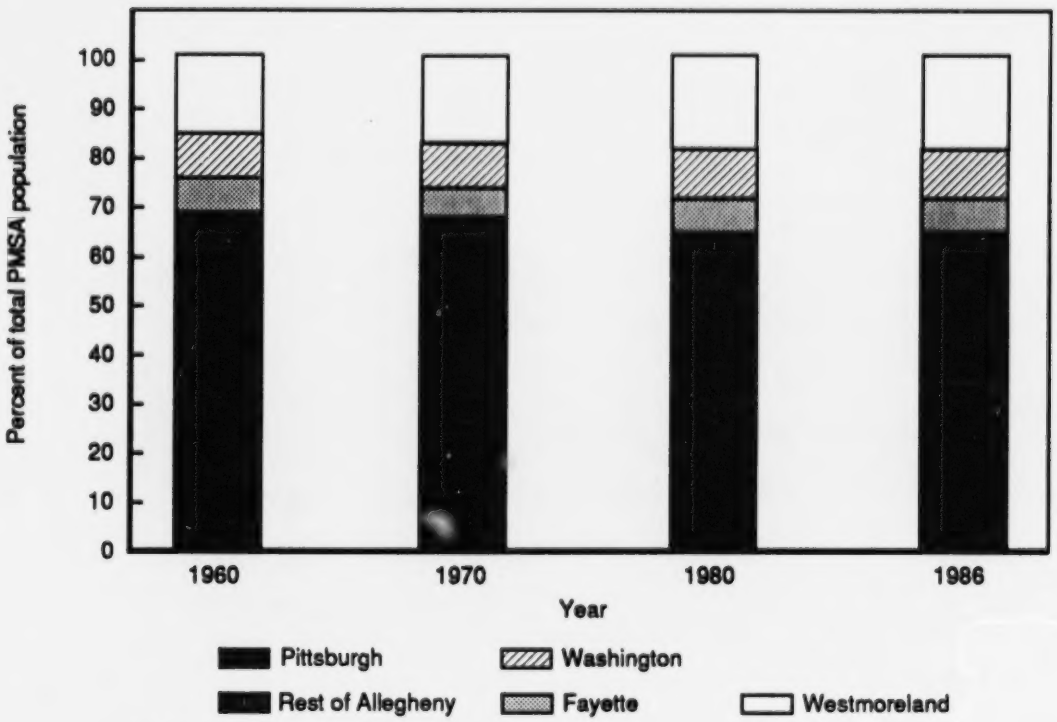
in recent years, partly because they could draw on a pool of underemployed workers displaced during the massive shifts from manufacturing to service employment earlier in the decade. This source of workers will diminish in the years ahead as workers displaced in the early 1980s reach retirement age.

POPULATION DISTRIBUTION IN THE REGION

Like virtually all older central cities, Pittsburgh has lost population to its surrounding counties over the past several decades (Fig. 9). In 1960 about 26 percent of the PMSA's population lived in the city; by 1986 the proportion had declined to 18 percent. Allegheny County had also lost population relative to the other counties. However, the rate of deconcentration is not extreme.

This aggregate picture obscures an important problem. Over half of the region's minority population (almost entirely black) lives in the city. The rest is concentrated in McKeesport and Clairton. Although jobs and population as a whole may be reasonably well collocated throughout the metropolitan area, many of the good jobs for which minority workers are qualified do not seem to be located close to neighborhoods where they live.

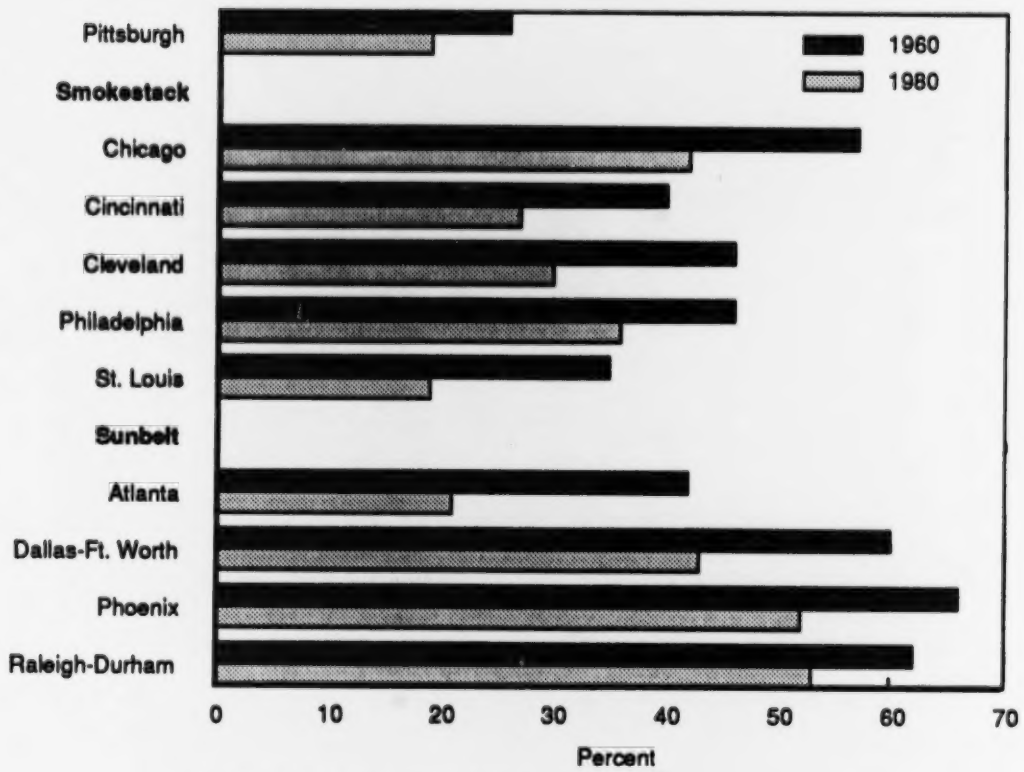
Pittsburgh is an unusually small city relative to its metropolitan area. Figure 10 shows the proportions of the PMSA represented by the central city for ten metropolitan areas. Pittsburgh has less than 20 percent of the area's population, a percentage rivaled only by St. Louis and Atlanta in this list.



SOURCE: City and county data books.

Fig. 9—Components of metropolitan population through time

The relatively small proportion of the population in the city means that efforts to improve the development of human resources relevant to the regional labor market must be focused on more than the city. The City of Pittsburgh has made a major effort to upgrade its elementary and secondary schools and has received assistance from businesses and foundations in the region. Less attention has been paid to educational improvement in many of the region's other school districts. However, the city schools enroll less than 20 percent of the region's students. Efforts to upgrade the region's elementary and secondary schools must extend much beyond the city.



SOURCE: City and county data books.

Fig. 10—Central cities compared with their metropolitan areas

IMPLICATIONS OF ECONOMIC AND DEMOGRAPHIC CHANGES ON THE WORK-RELATED EDUCATION SYSTEM

The economic projections suggest a modest expansion of Pittsburgh's economy and workforce between now and 1995 or 2000. Demographic projections suggest a decline and aging of the working-age population. For these trends to occur simultaneously, the region will need to make better use of its human resources. Young people now dropping out of school or relegated to low-skilled jobs must become more productive members of the region's labor force. Homemakers, displaced workers, and others not now in the labor market should be provided with the skills and services needed to enter it. Current members of the labor force will be pushed to become more productive. These changes will depend heavily on improved performance of the work-related education and training system.

But simply increasing the use of existing human resources alone will not be sufficient. Technological change and national and international competition will continue to restructure industry. If Pittsburgh is to compete effectively with other communities across the country and the world, it will need a labor force able to adapt to these changes. For this, the workforce needs skills different from those traditionally emphasized in formal schooling. The ability to solve problems in changing environments, to effectively communicate with customers and suppliers, and to regularly acquire new skills is important. School curricula should be re-examined and the roles and missions of the components of the work-related education and training system may need to be adjusted.

Continuing education, both to upgrade skills for current jobs and to develop skills for new jobs, is particularly important for Pittsburgh. The increasing numbers and importance of smaller employers suggests that more of this education and training may need to be provided outside the workplace by a variety of educational and training institutions. It is possible, as well, that this same trend toward employment in smaller establishments will reduce the employers' incentives to invest in training and, consequently, will increase the pressure on the public sector and private individuals to fund such training.

Finally, it is important to reiterate that this is a regional problem. Economic development is occurring across the region and 80 percent of the population lives outside Pittsburgh. Meeting the demands for work-related education requires that efforts be instituted throughout the region.

III. MAPPING THE PITTSBURGH REGION'S WORK-RELATED EDUCATION SYSTEM

As suggested in the previous section, the Pittsburgh region's economic and demographic situation poses significant challenges, particularly for the elements of its education system that provide work-related skills. Our research was designed to identify and broadly describe the work-related elements of this system. We sought to understand where people obtain work-related skills and how the resources are allocated among the institutions and activities providing the education and training. We were also interested in learning about the performance of the education and training activities. Again, we were concerned with the region as a whole.

This information, which we term a map, provides an essential context for considering actions and policies that might improve the performance of the system. It is intended to help the community avoid the all-too-frequent tendency to focus on just one system or institution or to forget the important linkages among them.

PROVIDERS AND ENROLLMENTS IN THE WORK-RELATED EDUCATION SYSTEM IN THE PITTSBURGH METROPOLITAN AREA

Table 3 provides a broad quantitative description of the components of the work-related education system in the Pittsburgh metropolitan area. The enrollments shown are for 1985 and constitute estimates of the numbers of people who are enrolled in sub-baccalaureate programs providing occupational skills. We have divided the system into four broad sectors—formal secondary education systems, formal postsecondary education institutions, informal postsecondary education and training, and apprenticeships. Most of these sectors will be treated in more detail in subsequent pages.

Numerous school systems provide secondary vocational education but they vary in the way in which they deliver it. The Pittsburgh city schools provide all of their vocational education in comprehensive high schools. The rest of the school districts provide some less specialized education (such as home economics or business courses) in comprehensive high schools and send students seeking more specialized training to Area Vocational Technical Schools (AVTS), which typically serve 10 to 12 school districts. In the 1985-86 school year, about 30 percent of the region's secondary students were enrolled in vocational education; in Pittsburgh 42 percent were in vocational education programs.

Table 3

WORK-RELATED EDUCATION SYSTEM PROVIDERS
AND ENROLLMENTS IN PITTSBURGH AREA
1985-1986

Providers	Number of Providers	Enrollments
Formal secondary		
Public secondary	80 systems	31,000
AVTS	12 schools	(8,500)
Formal postsecondary		
State-related	6 institutions	1,400
Private	12 institutions	450
Community colleges	2 institutions	13,000
Proprietary schools	70 schools	18,000
Adult education	NA	5,300
Apprenticeship	450 programs	3,400
Informal postsecondary		
Business firms	NA	NA
Community-based orgs.[a]	>28	NA

[a] CBOs and nonprofit organizations from JTPA vendor list.

Most formal postsecondary enrollment in vocational and occupational areas is in community colleges or proprietary schools; four-year schools provide relatively little sub-baccalaureate training. There are two community colleges, the Community College of Allegheny County (CCAC) and Westmoreland County Community College. The other two counties have no community colleges but CCAC does provide some courses in Fayette and Washington counties. Three-quarters of the proprietary schools are in Allegheny County where most are clustered in and around Pittsburgh.

We have no direct, comprehensive information concerning training provided by businesses in the Pittsburgh metropolitan area.[1] Undoubtedly the numbers of firms providing

[1]Obtaining information on work-based training is difficult and not possible within the resources available for this study. See Anne P. Bartel, *Utilizing Corporate Survey Data to Study Investments in Employee Training and Development*, Institute for Education and the Economy, Teachers College, Columbia University, February 1989.

direct training and the number of people receiving it are larger than any other entries in Table 3. Apprenticeship training continues to attract a modest number of people in largely traditional occupations.

Training for displaced workers, unemployed youth, welfare recipients, and other unemployed and disadvantaged individuals is often provided by community-based organizations (CBOs) such as United Way or the Urban League. There are many such organizations in the community, but the number shown in Table 3 is for the subset of those organizations engaged in job training. It is taken from the vendor lists of the Allegheny County and Pittsburgh City Service Delivery Areas established under the Job Training Partnership Act (JTPA).

DISTRIBUTION OF EXPENDITURES FOR WORK-RELATED EDUCATION AMONG PROVIDERS IN THE PITTSBURGH REGION

It is helpful to know the allocation of fiscal resources among elements of the work-related education and training system. The amount of resources spent by each element provides a first-order indication of the relative importance of the different classes of institutions to work-related education as we have defined it.

RAND has estimated the direct expenditures for sub-baccalaureate work-related education (see Fig. 11).[2] In 1985, total resources directly spent on work-related education and training were estimated to be $550 million. Two-thirds of this amount was for postsecondary education and training. About 70 percent of postsecondary expenditures is estimated to be made by employers for training that is tailored to their own needs.

Estimated expenditures for work-related education in proprietary schools are almost double those in the community colleges. The higher expenditures compare with enrollments that are only 40 percent higher than in the community colleges (see Table 3). The difference in expenditures compared with enrollments is largely the result of two factors. On average, the costs of proprietary schools per full-time-equivalent student are somewhat higher than those in the community colleges and a significantly higher proportion of the enrollees in proprietary schools attend school full time.

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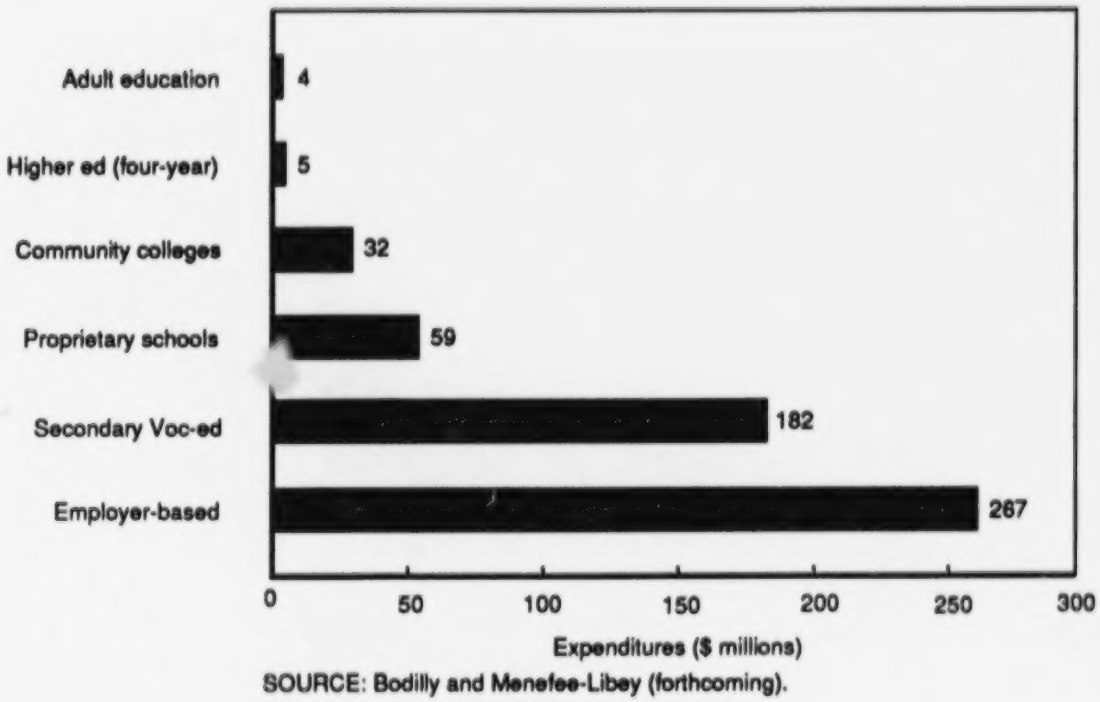
[2]Estimating expenditures for components of education involves a host of assumptions. RAND's estimates will be documented in Bodilly and Menefee-Libey (forthcoming), *Mapping the Pittsburgh Work-Related Education System.* The estimates for employer-based education and training are based upon national data on expenditures per firm or employee. This information is used with data on the size and number of work establishments in the Pittsburgh region. The national data are of relatively low quality so that the estimate shown here should be viewed as only a first approximation.



SOURCE: Bodilly and Menefee-Libey (forthcoming).

Fig. 11—Distribution of expenditures among providers of work-related education, 1985-1986

The expenditures for secondary vocational education constitute about 16 percent of the total expenditures for secondary education in the region.

SECONDARY VOCATIONAL EDUCATION

Nature of Secondary Vocational Programs

Nationally, there is considerable debate over the appropriate curriculum emphasis for secondary vocational education. Some argue that few if any programs providing job-specific skills should be offered at the secondary level. Employers frequently state that they want students with good basic skills, appearance, and discipline. They will provide the job-specific skills that are needed. Others note that skill requirements are changing so rapidly that specific skills offered at the high school level will be rapidly made obsolete if they are

not already. They believe that generic skills should be provided that enable students to rapidly acquire and upgrade job-specific skills over the course of a lifetime. Still others argue that increases in required skill levels in most occupations require postsecondary training so that job-specific skills taught at the high school level have very limited relevance.

A more traditional view, however, argues that secondary schools do provide an important source of training for several classes of employers. People we interviewed indicated that many high school graduates of vocational programs take jobs with small companies. In contrast to large employers who can provide job-specific training, small employers have limited ability to do so and often want young people who already possess some occupationally specific skills. They seek low-wage workers who can increase their initial skills through informal on-the-job training. Later these young people may use the acquired skills to find better paying jobs with larger employers.

Finally, educators often argue that the concrete, hands-on learning experience is relevant to important classes of young people who do not do well in formal academic subjects. They believe that in the absence of vocational programs, many of these people will drop out of school. Critics counter that this perspective effectively makes vocational programs an educational track for those perceived as less able and institutionalizes low expectations for their performance.

Obviously, choices concerning the balance of generic and specific job skills in secondary school programs constitute a key curricular decision that cannot be made without solid familiarity with the continuing changes in the job market.

The distribution of secondary vocational education program enrollments for the 1986-87 school year is shown in Fig. 12. The most striking feature of this figure is the high proportion of enrollments in home economics and consumer programs. Some of the home economics courses prepare people for occupations such as child care; many provide instead skills related to family life.[3] The nonoccupational home economics programs do not properly belong in a listing of work-related education programs.

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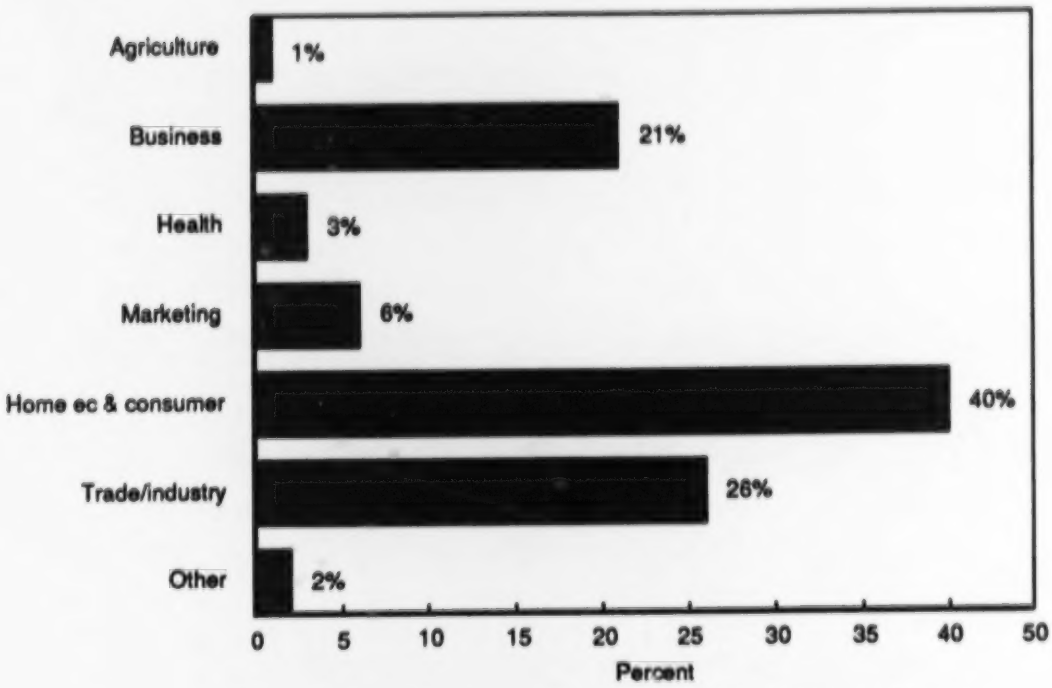
[3]Nationally in 1982, 15 percent of all vocational course credits were earned in home economics and consumer education courses (U.S. Department of Education, *First Interim Report from the National Assessment of Vocational Education*, Washington, D.C., January 1988, Table 1-3.) However, this figure cannot be directly compared with the 40 percent shown in Fig. 12, because programs vary in credit requirements and some credits can be earned without enrolling in a program.

It is also surprising that such a high proportion of students are enrolled in trade and industry programs, given that the region has lost a significant proportion of its blue collar jobs. This appears to reflect the needs of many small employers for relatively low-paid entry-level people who possess enough skills to begin a job.

Although 60 percent of the region's vocational education graduates report that they go immediately to work (including joining the armed services), nearly 30 percent continue their education or training. It is quite likely that others will soon return to education. (Nationally, 42 percent of 1982 graduates of vocational education programs had enrolled in formal postsecondary programs within four years after graduation.)[4] Thus, judging the



SOURCE: Vemis System, Pennsylvania State Department of Education.

Fig. 12—Distribution of enrollments among secondary vocational programs

[4]U.S. Department of Education, *Second Interim Report from the National Assessment of Vocational Education*, Washington, D.C., September 1988, Table 1-2.

appropriateness of the distribution of enrollments among programs depends on understanding not only the needs of small employers but the requirements of the many graduates who will go on to further education rather than immediately entering the labor force.

Whether students go immediately to work or go on to school, research at the National Center for Education and Employment and elsewhere suggests that all students should have generic skills related to work that permit them to perform well and adapt to changes in the workplace. Many of these skills may be taught in the context of "hands-on" occupationally specific courses or in courses providing more general or academic skills. To fail to provide such skills will make it difficult, if not impossible, for the student to avoid relegation to low-skilled dead-end jobs.

Indicators of Performance

There is little systematic knowledge concerning the performance of the region's secondary vocational education system. No regular testing of skills possessed by secondary vocational education graduates is required by the state. High school completion rates seem fairly high. According to the State Department of Education, dropout figures for all of secondary education in the region are about 9 percent compared with 14.4 percent for the state as a whole. Pittsburgh's dropout rate is significantly higher at 22 percent, although that figure is less than that in many big city schools. As is the case across the nation, dropout rates for blacks are higher than those for whites. The region has very few members of other minority groups.

The state collects data on job placements and educational continuation. Eighty-seven percent of graduates of secondary vocational education are reported to be gainfully placed in the region compared with 89 percent statewide.[5]

We asked a few employers and postsecondary school educators about the preparation of secondary school students. Few expressed strong concern about a deterioration in the skills of students. CCAC provides remedial education in basic skills to a higher proportion of their students, but whether this is due to a decline in quality of preparation or to more extensive entrance testing is unknown. A significant number of those interviewed indicated that new job entrants and postsecondary students lacked the motivation that past students have had.

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[5]For the region, those defined as gainfully employed are graduates who are employed in a job-related field of study (31 percent), employed in a job unrelated to their field of study (21 percent), in military service (6 percent), and pursuing further education (29 percent).

Required Changes in Secondary Vocational Education Programs

It is fairly easy to interpret the results of our interviews and the surveys of placement as suggesting satisfactory performance, at least from the point of view of the region's employers. Even if this may have been true in the past, it is less likely to be true in the future. The interviews occurred at a time when employers were still emerging from a period of high unemployment and the displacement of relatively skilled labor who became available for recruitment. The latter source of labor will gradually age at the same time as the number of young workers declines. These declines, coupled with the apparent changes and increases in skills required by many in the labor force, mean that current performance will need improvement.

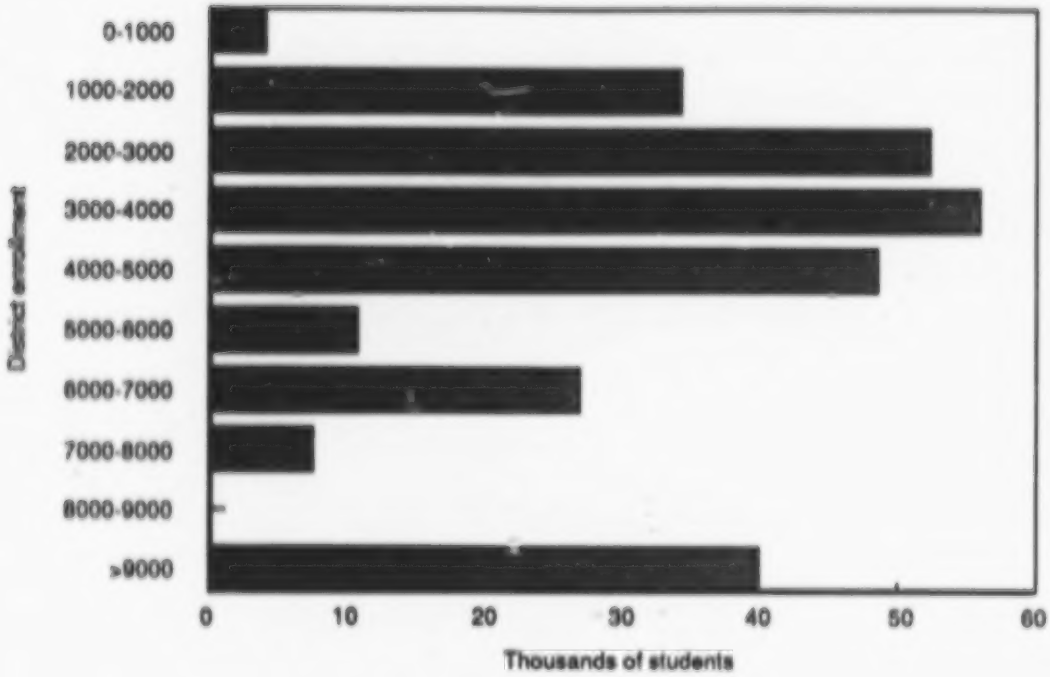
Needs of the local economy are not the only motivation for change. Pennsylvania has mandated increased attention to academic skills and toughened vocational programs. This has posed problems for the vocational education community. Requirements for additional courses in math, English, and science make it more difficult for students to schedule the courses required to complete vocational programs. At the same time Pennsylvania increased its vocational program course requirements, reinforcing the problem. School districts of the region have scrambled to revise curriculum and programs.

Capacity for Change

It has been difficult to make changes because secondary school enrollments in the region have dropped significantly and are expected to continue to do so. Enrollments dropped 33.5 percent between 1975 and 1985, nearly three times the national rate. The attention of school administrators undoubtedly focuses more on dealing with this general decline than on improvements to vocational education offerings.

AVTS have been particularly hard hit by these enrollment declines. The "sending" schools appear increasingly reluctant to send students to these schools because they wish to retain the state revenues associated with the students thus lessening their own need to contract in size. Moreover, the added course requirements make it harder to accommodate the required transportation time in the student's schedule. The AVTS report declines in both numbers and quality of the students enrolling.

Another problem affecting the capacity for change is the fragmentation of elementary and secondary education. Pennsylvania emphasizes local control of elementary and secondary school systems. In the Pittsburgh region, there are numerous small school systems. Figure 13 shows the distribution of the number of students in various sized school



SOURCE: Penn. Dept. of Education.

Fig. 13—Fragmentation of school districts

districts. For example, about 56,000 students are in school districts having total enrollments between 3,000 and 4,000. Most of the students are in school districts with fewer than 5,000 students. Of the 80 school districts in the metropolitan area, 76 have fewer than 5,000 students and only one has more than 8,000 students.

Decisions to retain small school districts reflect the community's desire to assure responsiveness to local interests. However, if the region as a whole wants to increase attention to regional needs, the fragmentation means that a large number of diverse school leaders must be engaged in the problem.

The small size of the typical school district poses other problems. Small districts cannot afford much program development and experimentation. They lack resources to provide in-service training for their staff or extensive evaluation of instructional materials. Thus they have limited capacity to respond to requirements for changes in programs.

Several institutions exist to deal with the problems inherent in the districts' small size. The AVTS, which serve multiple school districts, provide a scale justifying more specialized equipment and staffing. Each school district is also associated with an Intermediate Unit (IU), which provides specialized services (particularly in the area of special education), administers demonstration programs, and provides some staff training. The IUs are generally, but not always, coincident with counties. Our interviews suggest that the IUs currently have limited capacity, resources, and mandates to assist their member districts.

Finally, the fragmentation of the school system has another important consequence. Linkages of schools to employers and postsecondary institutions are important to assuring program relevance and smooth transitions between school and further schooling and work. Such linkages are difficult to make for the 80 percent of the secondary students in districts other than Pittsburgh because of the large number of linkages that are required.

To Summarize

As a whole, the region's secondary vocational education system is not currently seen as performing poorly, though the evidence concerning performance is scanty. However, strong positive support was restricted to a few exemplary projects. Significant numbers of students are dropping out, but the numbers are not alarming by national standards. There is widespread concern about the decline in motivation of labor force entrants.

There is reason to be concerned about the future. Changing requirements for skills mean continuing need for modification of programs. State efforts to promote academic and vocational education quality impose (it is hoped) complementary pressures for improvement. Emerging demographic changes make it more important to retain and educate those who are now dropping out, suggesting further need for changes in programs.

The need for change is imposed upon school systems that face considerable difficulties in implementing change. The small size of many of the districts limits the resources available for improvement. Declining enrollments further strain the resources. The fragmentation also makes it difficult to adequately engage employers in the development of programs. The Pittsburgh city schools have fewer problems in this regard having received generous support from the community. But even here, the shortage of resources constrains their adaptation to new needs.

Finally, from the point of view that motivated this study, the large number of small districts provides a profound problem. We initially contemplated a community-based strategic planning effort for the region that engaged the leaders of the educational institutions

and systems in the region. The fact that 80 percent of the secondary students are in 79 separate districts means that meaningful participation in such an effort is very difficult to bring about.

FORMAL POSTSECONDARY EDUCATION

Enrollments in formal postsecondary work-related schooling have increased in the past decade, reflecting the increased skill requirements of jobs and the need for training among those who wish to switch careers or need to adapt to changing job requirements. The bulk of the formal postsecondary work-related schooling is provided by community colleges and proprietary schools. Between 1973 and 1986, enrollments in the region's community colleges increased 25 percent. The data for total enrollments in proprietary schools are less easily obtained, but enrollments in programs leading to associate degrees in those institutions increased 36 percent between 1978 and 1987.

These two classes of institutions appear to serve quite different populations. Proprietary schools are said to serve individuals who are reasonably certain what they want to do and anxious to quickly acquire the skills and placement help that are needed to obtain a job. A higher proportion of the students in proprietary schools, as compared with community colleges, attend full time and complete their program. It is generally thought that the training-related placement rates of proprietary schools are higher than those of the community colleges. Certainly, in interviews with proprietary school administrators, discussions of placement and placement strategies played a larger role than was the case in other institutions.

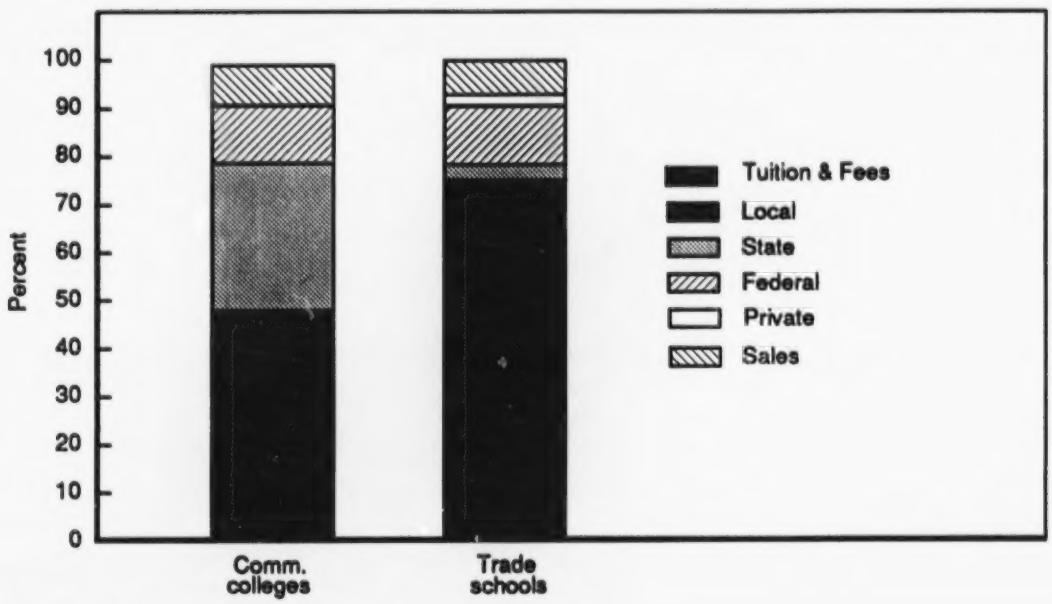
The community colleges, on the other hand, enroll many more part-time students, many of whom do not complete their programs. By design, the community college is intended to foster transfer to other institutions of higher education. It appears that the community college provides many students who have not made up their minds about their futures with an opportunity to acquire a variety of skills while they are deciding. The appropriateness of this role and the amount of effort that community colleges should put into raising completion rates is an important policy issue for those colleges.

As largely publicly financed institutions, the community colleges also respond to publicly identified needs. In the early 1980s when there were large layoffs in steel and related industries, CCAC provided programs that were designed to help displaced workers acquire the skills necessary to embark on new careers. In the past year, a similar program has been reinstituted. CCAC also has an active customized job training program that provides education and training programs tailored to the needs of local employers.

Sources of Funding

The different character of these two classes of institutions is partially attributable to the manner in which they are funded. Figure 14 shows the sources of funding for associate degree programs in proprietary schools and the community colleges generally. The overwhelming proportion of funds for the proprietary schools is obtained in the form of tuition and fees. Much of this tuition is financed through loans guaranteed by federal and state government.

The community colleges generally receive about a third of their funding from state government, another third from the county government, and a third from tuition. Some of the tuition is in the form of grants from the federal government. Guaranteed student loans also help finance community college tuition.



SOURCE: Bodilly and Menefee-Libey (forthcoming).

NOTE: Funding for trade schools is only for associate degree programs.

Fig. 14—Sources of funding for postsecondary schools

The sources of an institution's funding affect its behavior. The proprietary schools, where average annual tuition is three times higher than that at the community college, must compete for students. These schools sell themselves on their ability to place students and the relevance of their training to getting a job. Because they are generally quite small, they emphasize personal attention to the student and quick responses to changing requirements of the workplace. Nationally, there is concern that significant numbers of proprietary schools concentrate their efforts on enrolling disadvantaged and welfare populations who can obtain federal grants or guaranteed loans rather than on providing good training. This does not appear to be the case in Pittsburgh. Generally, our interviews suggest that the proprietary schools are seen as providing good and relevant training.

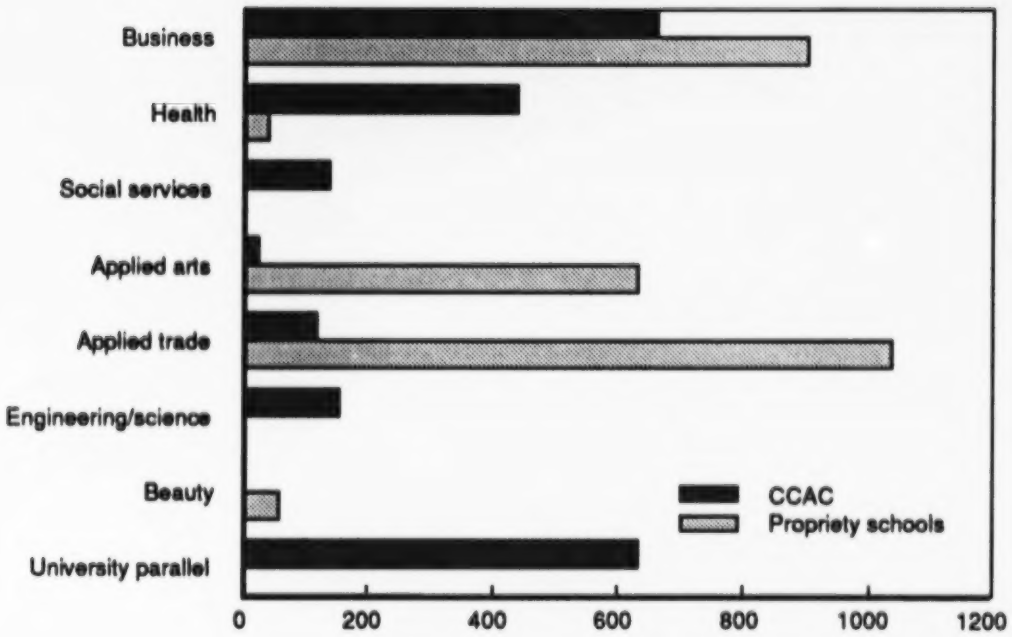
The community colleges are far more complex institutions that serve many purposes and interests. Compared with proprietary institutions, they provide a much wider variety of program offerings and place more emphasis on courses that are intended to provide broader skills. The faculty plays a larger role in ensuring that the program offerings provide what they believe constitutes appropriate academic and occupational skills. Decisions on changes to courses and programs are more widely reviewed than in the proprietary schools where the director often participates in developing the changes directly.

However, the community colleges provide a vehicle for considerable educational entrepreneurship. Numerous examples exist of programs developed in conjunction with employers, such as local hospitals. The public subsidy also permits them to provide courses tailored to the needs of particular employers (customized job training) at lower costs to those employers than would be the case if the employers provided the training themselves.

Nature of Programs

We do not have data on all the program offerings in the community colleges and proprietary schools. However, the state does publish data on the associate degrees that the proprietary schools award, and the CCAC publishes similar data. These data are shown in Fig. 15. If such degrees are representative of the offerings of the two classes of schools, they suggest that the community colleges and the proprietary schools do not compete directly except in business-related programs.

These data, in combination with our earlier observations, suggest that the public and private sector postsecondary institutions in Pittsburgh provide complementary programs that serve different clientele and missions. On the basis of our interviews, it appears that this complementarity is the result of "market forces," because there appears to be very little



SOURCE: CCAC Bottom Line, Pennsylvania State Department of Education.

Fig. 15—Associate degrees awarded by Community College of Allegheny County and region's proprietary schools, 1985-1986

direct contact between the proprietary schools and either the community colleges or the elementary and secondary education system.

Indicators of Performance

There are few credible indicators of system performance at the postsecondary level. CCAC publishes a useful annual report describing the student body and its enrollments and some limited information on postenrollment experience. The proprietary schools provide data on placements but indicate that the base against which these placements are measured is not consistent among schools. The employers we talked with tended to have experience with only a handful of schools and to be unwilling to make general statements.

In Summary

Pittsburgh provides a reasonably lively sub-baccalaureate postsecondary education system. A fair degree of competition among institutions exists so that the chances are good that new educational offerings will be available to meet the needs of a changing workplace. There is a good base to build on for the future.

The nature of this competition depends heavily on the policies of federal, state, and county government. Student loans and grants are important to the survival of the proprietary schools. The terms of the state and county grants to the community college also shape its behavior, and student loans and grants allow it to reach out to low-income populations. The health and actions of this important element of Pittsburgh's work-related education system is thus responsive to policies fixed outside the region itself.

We heard few complaints about the performance of this sector but improvements in the publicly available indicators of performance could help the planning of the region's corporate and education leadership.

FIRM-BASED TRAINING

Little is known about training provided in the workplace, either nationally or regionally. We estimate that nearly 50 percent of the resources devoted to work-related education in the metropolitan area is directly spent by employers. (This estimate takes no account of the losses in production associated with the activities of the trainers and the trainees.) There is much uncertainty in this estimate, which is based upon an extrapolation of national data. We cite it largely to make the point that the quality of the region's labor force depends, to a large extent, on the training that is provided by its employers.[6]

This observation has important implications for individuals in the region. Studies using national data suggest that employers invest significantly less in employees having little education, few skills, and little experience. If individuals fail to obtain an education from the formal school system that permits them to obtain employment with firms willing to invest in them, they will be cut off from much of the training that might enable them to advance in the labor market.

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[6]The estimates are described in Bodilly and Menefee-Libey (forthcoming). These estimates include direct expenditures by employers for training delivered either on the employment premises or elsewhere. Since some of the expenditures are undoubtedly for courses in the formal education system, there is a certain amount of double-counting in our figures. Its effects are certainly less important than the general uncertainty surrounding the figure for firm-based training.

As we noted in our earlier discussion of the declining size of work establishments, it is possible that fewer workers will receive employer-provided training in the future because more workers will be employed in smaller firms that are unable or unwilling to provide training. Indeed, it is possible that some of the enrollment increases in formal postsecondary institutions are the result of this downsizing of employment establishments. Customized training provided by the community college may provide one important link between the formal education system and the employer that improves the relevance of publicly financed education and training to the labor market.

Whether it is appropriate for the public to support training that is tailored to the needs of specific employers is an important policy issue. Traditionally it has been argued such support is an inappropriate subsidy to employers who should be paying for such training themselves. Others have argued that the private sector invests less in human capital development than is desirable from the community's perspective and that public subsidies are needed to increase that investment. The rapidity of externally induced technological change, the competitive position of the region, and the changing structure of employment all suggest that traditional views on this subject need re-examination.[7]

TRAINING AND SERVICES FOR THE DISPLACED AND DISADVANTAGED

Programs for the disadvantaged and displaced are fairly widespread throughout the community. Public secondary schools devote considerable effort to the disadvantaged and, as noted above, the CCAC has developed several programs for displaced workers. Unions and management have also provided such programs when major plants have closed. Aside from noting their existence, we have made no attempt to describe programs funded as parts of a larger educational activity or as an *ad hoc* effort to deal with a short-term problem.

Training for disadvantaged youth and adults has been a national concern since the early 1960s. It has taken the form of numerous manpower training programs, most run by the Department of Labor. Currently, the most visible manpower training program is JTPA. Under this act, state governors create service delivery areas (SDAs) responsible for programs in a specified area. These SDAs are subject to policy guidance and oversight of Private Industry Councils (PICs) made up of employers, community leaders, and knowledgeable citizens. Performance standards are established by the federal government

[7]Roger Vaughn and Sue Berryman, *Employer-Sponsored Training: Current Status, Future Possibilities*, The Institute on Education and the Economy, Teachers College, New York, February 1989, pp. 28-31.

and modified by the state to create clear guidance concerning the outcomes and costs expected in the program. The programs are generally targeted on disadvantaged groups and displaced workers. There are specific programs for youths.

In the Pittsburgh region, four SDAs contract for assessment, training, and placement services with CBOs, community colleges, proprietary schools, private employers, and other education agencies. (Most of the JTPA funds are included as expenditures in the provider institutions in Table 3.) As a proportion of the total investment in work-related education and training, the JTPA programs are small—accounting for less than 5 percent of the total expenditures for work-related education in the region. However, those are the only funds continually and explicitly targeted on the long-term unemployed and disadvantaged. Under the formulas that have governed the allocation of funds at the state and national levels, the funding of these programs has been decreasing steadily as the reported unemployment in the region has declined.

The largest programs are in Pittsburgh and the rest of Allegheny County. Pittsburgh relies heavily on performance-based contracts with CBOs and trade schools as well as employers. The county uses fewer performance contracts and makes greater use of the community college. The other SDAs make heavy use of the AVTS.

Because the funding levels, regulations, and legislative provisions associated with federal manpower programs have changed so continuously, the managers of the JTPA programs must spend a great deal of time assuring that their programs conform to these requirements. The result is that despite attempts to take the initiative and plan, the programs tend to be reactive and shaped by federal and state actions.

The performance standards associated with JTPA funding relate to program enrollment, completion, and placement performance. They are generally credited with providing effective incentives to weed out ineffective service providers. At the same time, they are also said to provide incentives to enroll only the most able and trainable individuals in the target populations. This is particularly the case when funding is limited relative to the size and needs of the target populations.[8]

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[8]Although we could not examine these claims in Pittsburgh, a recent national study has taken up the question. They find some evidence that the most difficult to train individuals are slighted in states that establish high standards and reward SDAs for meeting the standards. However the size of the effects is small. See the National Commission for Employment Policy, *JTPA Performance Standards: Effects on Client Services and Costs*, Washington, D.C., 1988.

CONCLUSIONS

Section II summarized the Pittsburgh region's emerging needs for work-related education. Changing industrial composition and structure will require new skills, both at entry to the labor market and during an employee's working life. Declines in the working-age population and particularly the younger portion of it mean that major efforts must be made to make existing workers more productive and facilitate the entry into work of those not now in the labor force. Finally, many of Pittsburgh's young people will choose to leave the area and require the kinds of skills necessary to ensure success in other communities.

Broad improvements in the region's elementary and secondary system are likely to be hampered by the fragmentation of the system. This fragmentation coupled with the small size of the individual districts limits the ability to develop new programs and retrain staff. It also makes it more difficult to provide occupationally specialized training that requires specialized facilities or staff. This inherently difficult situation is made worse by the continued decline in enrollments that stresses administrators and staff and limits possibilities for change that accompany growth. It seems clear that most of these districts cannot make significant changes and improvements in their programs on their own.

The community colleges and proprietary schools have not been as hard pressed by such enrollment declines and seem to offer significant and complementary capabilities for meeting what are likely to be increased needs for training and retraining. The fact that they compete with one another seems to make them responsive to local needs. They provide a good base for further development but the nature of that development will be significantly influenced by state and national policies.

The largest providers of work-related training are the region's employers. Because of its diffuseness, we developed little direct knowledge about their efforts. Their training is targeted on those workers offering the best return, generally workers with higher levels of education and good work histories demonstrated by job tenure and work experience. However, there is every reason to expect that the nature of their training activities will change as technologies and workplace organization change. The consequent shifts in both the substance and locus of training make improvements in linkages between employers and formal education institutions particularly important.

The economic and demographic changes that appear likely in the area make it important to reach potential workers who currently have marginal attachment to the labor force, entirely aside from the community's normal desire to help all of its citizens to lead productive and rewarding lives. Both resources and strategies for reaching these people

appear limited at present. Under current funding and standards, program leaders indicate their programs cannot afford to remedy the inadequate basic skills of disadvantaged individuals, thus limiting their access to further training by employers. In light of the limited available resources, it seems desirable to assure that JTPA activities are planned with maximum attention to the other resources available in the community.

For the system as a whole, there is little systematic information on performance. Some data are available for system elements. Some follow-up surveys of high school graduates exist but have limited validity and do not appear to be used by decisionmakers. The community college collects data on program performance and is moving to use such information to help decide when program revisions are appropriate. Many proprietary schools keep placement data, which are used both for self-assessment and advertising. The JTPA programs generate considerable data that are required by state and federal officials. However, the reliability and comparability of these data are unknown and conceptual structures integrating them do not exist. Judgments concerning the performance of the system must be impressionistic and partial.

IV. WHAT CAN BE DONE?

The study reported here investigated likely future demands for the development of work-related skills in the Pittsburgh region together with the character of the education and training system that is available to meet these demands. We found an array of institutions that appear to be performing tolerably well from the perspective of the employers in the community. Future changes in required work skills coupled with the evolution of Pittsburgh's demography will require improvements in performance. No one cited the system as "world class"—as providing Pittsburgh with a comparative advantage over other communities with which it competes.

The study is intended as a starting point for community-based planning for improvements in the work-related system. Consequently, we have not investigated specific actions that might be taken to deal with problems that are raised here. Nonetheless, we can suggest some actions that might serve to improve the functioning of the work-related education system and, indeed, the education system in general. These are not recommendations. Rather they provide grist for future discussion and debate about reform of the education system.

DEVELOP REGIONAL LEADERSHIP TO IMPROVE THE WORK-RELATED EDUCATION SYSTEM

Work-related education is a regional problem involving numerous institutions. Improvements in the system require strategic actions focusing on the features of the system most critical to success. Inevitably human, financial, and leadership resources are limited and must be marshaled to identify and address problems. It is possible that missions of existing institutions need to be clarified or redirected. New institutions may be needed. More generally, the region may want to create a vision of the work-related education system that it wants.

To foster discussion, consensus, and action, the Pittsburgh metropolitan area might create a regional organization to provide sustained attention to these problems. The mission of such an organization could include:

- Fostering consensus among leaders in the community concerning both problems and actions to deal with those problems,
- Promoting collaboration among key elements of the system,
- Convening task forces and working parties to deal with specific problems, and
- Publishing an annual report on the state of the work-related education system.

PROMOTE COLLECTIVE ASSESSMENT OF NEEDS IN K-12 SCHOOLS

Research on education reform in elementary and secondary school systems emphasizes the importance of engaging "frontline" teachers and administrators in assessing needs and seeking improvement. Even if this were not good practice, the multiplicity of jurisdictions makes centralized attempts to plan reform unfeasible. To engage faculty and administrators in a reform process, a coordinated assessment of needed changes in program, curriculum, or organization might be organized. Although the assessments would be made by each school system individually, they might be initiated with questions that are common across the region, supported with intellectual resources made available to school systems jointly, and shared with one another. Brought together and summarized, these assessments could point to regional actions needed to provide necessary leadership and resources.

IMPROVE AND PUBLICIZE INDICATORS OF STUDENT AND SYSTEM PERFORMANCE

No system of indicators of performance of the work-related education system exists. One approach to this problem is to develop a system of indicators that provides feedback on progress toward improving the education and training system, establishes expectations for improvements, and aids in the targeting of assistance. Since state and federal officials are increasingly emphasizing indicator systems and performance standards, early attention to such a system could help shape state activities in ways helpful to the region's education and training systems.

Creating such a system is a major task. Doing it in a way that promotes improvement rather than creating invidious and unproductive comparisons is a formidable challenge. Such a system could provide the empirical basis for an annual report on the state of the region's education systems.

CREATE OR STRENGTHEN MECHANISMS TO COUNTER FRAGMENTATION OF K-12 SCHOOLS

Mechanisms and institutions already exist to counter the fragmentation of the elementary and secondary school system, but they have weaknesses and often lack human and financial resources. Efforts could be made to strengthen:

- Area Vocational Technical Schools,
- Intermediate Units, and
- Regional consortia such as the Mon Valley Education Consortium.

The improvements could include changes in governance, mission, or means of financing. In the cases of the AVTS and the IUs, changes would require state actions.

IMPROVE LINKAGES AMONG ELEMENTS OF THE SYSTEM

The rapidity with which skill requirements and workplace organization are changing, the large number of education and training institutions in the region, and the diffuse nature of leadership for the region make directed coordination of the elements of the work-related education system impossible. The best way to assure the relevance of education provided to the region's citizens is to ensure that elements of the system are effectively linked with one another. Advisory committees are mandated for most programs at the secondary and postsecondary levels. Their effectiveness is reported to be uneven. More important are linkages through continued placement activities. The best of the proprietary schools place great emphasis on this form of linkage; it appears more difficult to develop and maintain in larger public institutions possessing more diffuse missions.

Linkages are also important among educational institutions, especially as schools are redefining missions and programs. Articulation agreements among secondary and postsecondary schools are an important means of establishing such linkages.

Specific program activities may also lead to improved linkages among education institutions and employers. The region might want to consider:

- A reinvigorated apprenticeship system that borrows features found in German programs and shares teaching responsibilities between education institutions and employers,

- An expanded customized job training program with improved articulation with the regular programs of the community college,
- A regional information, assessment, and counseling system to give individuals assessments of their skills and advice on employment opportunities as well as providing employers a place to seek recruits.

ALTER GOVERNANCE OR FUNDING STRUCTURES

Finally, the region may want to consider altering governance or funding structures for parts of its system. For example, many outsiders would argue that some school consolidation is desirable. We have found few people in Pittsburgh who think it is worth the political costs that would be involved. However, some of the benefits of consolidation might be achieved by strengthening the IU's capability to assist individual districts to develop new instructional programs.

Nationally, there are many advocating plans that permit students greater choice in where they attend schools and schools greater freedom to specialize in education programs. The dispersed nature of much of the region's population and the potential divisiveness of altered geographic enrollment patterns may make such plans unattractive in Pittsburgh. It is possible that training programs such as those now run with JTPA funding would be more effective if they provided vouchers to clients rather than assigning them to programs.

However, systemic changes in governance and finance take time and require the investment of substantial political effort. Consequently, it is likely that activities building on Pittsburgh's tradition of regional collaboration between employers, government, schools, and community leaders have a greater chance of early success than more radical changes.

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